

# Acousto-Optic Tunable Filter-Based Polarimetric Spectral Sensor With Progressive Algorithm For Material Analysis and Mapping, Phase II

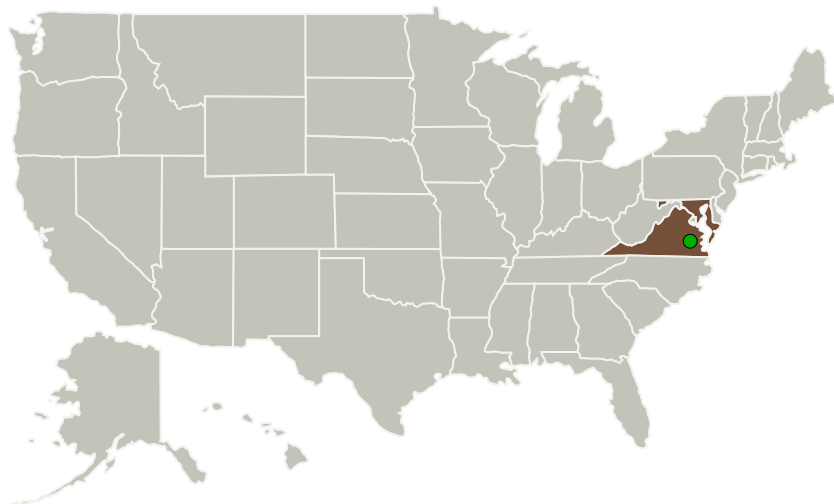
Completed Technology Project (2015 - 2018)



## Project Introduction

One of the strategic goals of NASA's Planetary Science Mission is to advance scientific knowledge of the origin and history of the solar system, the potential for life elsewhere. The current STTR addresses this strategic goal. The proto-type AOTF-based SWIR spectropolarimetric imaging system developed in Phase I (which will be further optimized and integrated with optimal algorithm/software in Phase II), will be a useful tool in determination of chemical composition and physical characteristics of planets of interest, short period comets, primitive meteorites and asteroid bodies, and in identifying the sources of simple chemicals important to prebiotic evolution and the emergence of life. The concept and proto-type instrument developed in this program operates as a hyper-spectral imager as well as a spectropolarimeter. It is capable of obtaining hyperspectral images and the polarization state at the pixel level. It is compact, rugged in nature, fully electronically controlled and has no moving parts. The images can be taken at any desired wavelength/s within the operational range, in any sequence. Hyperspectral data cubes will be collected using aforementioned systems. Before processing the spectral information in the data, system non-uniformity correction, spectral response correction, and atmospheric correction will be applied to the data.

## Primary U.S. Work Locations and Key Partners



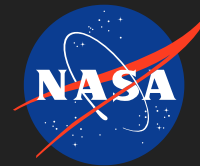
Acousto-Optic Tunable Filter-Based Polarimetric Spectral Sensor With Progressive Algorithm For Material Analysis and Mapping, Phase II Briefing Chart Image

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Organizations Performing Work	Role	Type	Location
Brimrose Technology Corporation(BTC)	Lead Organization	Industry	Sparks, Maryland
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia
University of Maryland-Baltimore County(UMBC)	Supporting Organization	Academia Asian American Native American Pacific Islander (AANAPISI)	Baltimore, Maryland

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Brimrose Technology Corporation (BTC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Sudhir B Trivedi

### Co-Investigator:

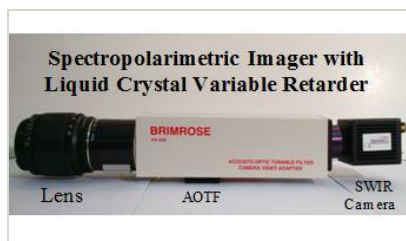
Sudhir Trivedi

## Primary U.S. Work Locations

Maryland

Virginia

## Images



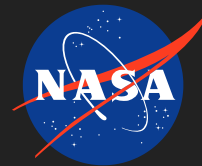
### Briefing Chart Image

Acousto-Optic Tunable Filter-Based Polarimetric Spectral Sensor With Progressive Algorithm For Material Analysis and Mapping, Phase II Briefing Chart Image

(<https://techport.nasa.gov/image/127669>)

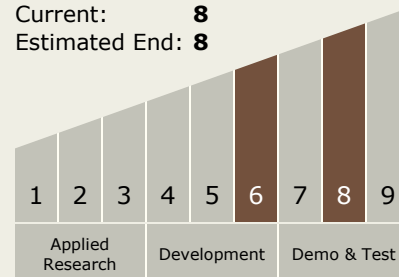
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## Technology Maturity (TRL)

Start: 6  
Current: 8  
Estimated End: 8



## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.3 In-Situ Instruments and Sensors
    - └ TX08.3.1 Field and Particle Detectors

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System